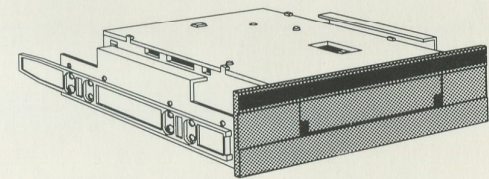


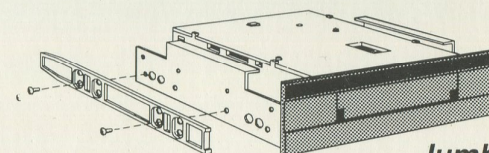
120 MB Tape Backup System

Hardware Installation Guide

For Installations With . . .



. . . And Without Mounting Rails



Jumbo 120 MB

COLORADO
MEMORY SYSTEMS INC.

**CANADIAN STANDARDS ASSOCIATION
INFORMATION STATEMENT**

INSTRUCTION TO USER:

WARNING: This component is only considered to be approved when installed in CSA certified equipment evaluated to the standards C22.2 No. 220-M1986 or C22.2 No. 950-M89. The operator accessibility into the end use enclosure is defined with strict accordance in the operator's manual for the installation of components into the equipment.

Important Notice

Important Notice

The data cable included with the JUMBO™ tape drive can **NOT** be used in selected models of the following computers:

- DEC®
- GRID®
- Panasonic®
- Tandy®

Use of the data cable included in this box in one of these computers may result in damage to your computer. If you have one of these computers, you must call Colorado Memory Systems™ Customer Support to receive a different data cable:

Customer Support Hours 7 A.M. - 6 P.M. MONDAY - FRIDAY Mountain Time	
In the U.S., Canada, and Mexico	(800) 845-7906
Outside U.S., Canada, and Mexico	(303) 669-6500
FAX	(303) 667-0997

F138 Rev. G

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JUMBO Reference

Record your tape drive's important information here for easy reference:

Serial # 2ND0000155
on JUMBO box label

Model # DJ-10SA
on JUMBO box label

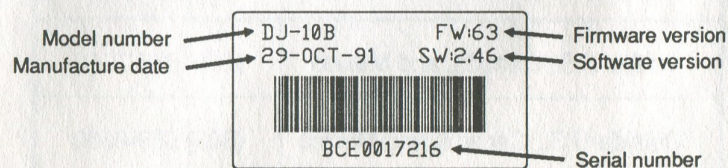
Firmware version FW:64
on JUMBO box label

Software version SW:2.52
on JUMBO box label

Manufacture date 29 APR 92
on JUMBO box label

Purchase date 12/03/92

Customer ID number _____
assigned to you if you call Customer Support



Sample label on JUMBO box

JUMBO 120 Features

- 120 MB capacity using data compression
- Plugs into diskette controller (250 and 500 Kb/s compatible)
- 40 MB backup typically in less than 12 minutes
- Novell® 286/386™ certified, 3COM®, LANtastic™, and IBM® token-ring compatible
- Unattended backup scheduler—nights, weekends, any time
- QIC-40 industry standard recording format
- One-year limited warranty
- Toll-free technical support

Hardware and Software Requirements

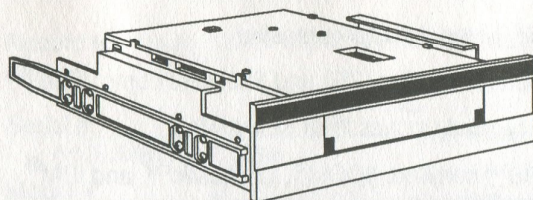
- PC, XT, or AT class computer
- One free 5.25", half-height installation bay.
- DOS 2.1 or higher (Type **ver** at the DOS prompt.)
- 320KB of available memory (Type **chkdsk** at the DOS prompt. Bytes free should be at least 320,000.)

If you do not have a free installation bay, you can install JUMBO externally. See the *Compatibility and Accessory Guide* for the required kits. You can also install JUMBO in a 3.5", half-height installation bay using either the BZ-35 compatibility kit or, for the IBM PS/2® (all models), the KM-20 compatibility kit.

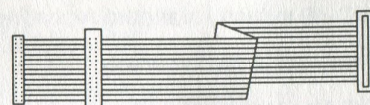
This installation requires JUMBO software version 2.30 or above and JUMBO firmware version 40 or above. See the label on the outside of the JUMBO box. If you do not have these software and firmware versions, call Customer Support at 1-800-346-9881.

What's Included

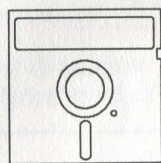
What's Included



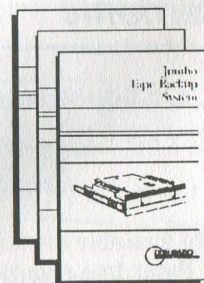
■ JUMBO 120MB tape drive



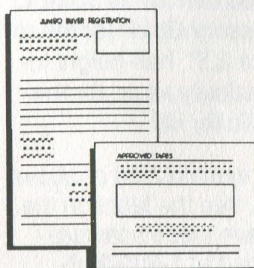
■ JUMBO data cable



■ Tape Backup System
Software diskette-5.25"
(Outside U.S.-2 disk-
ettes)



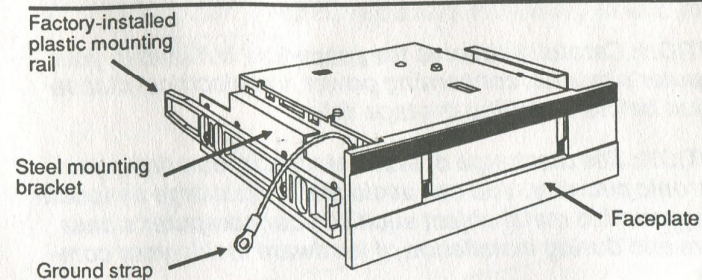
- Hardware Installation Guide
- Software Installation and Operation Guide
- Compatibility and Accessory Guide



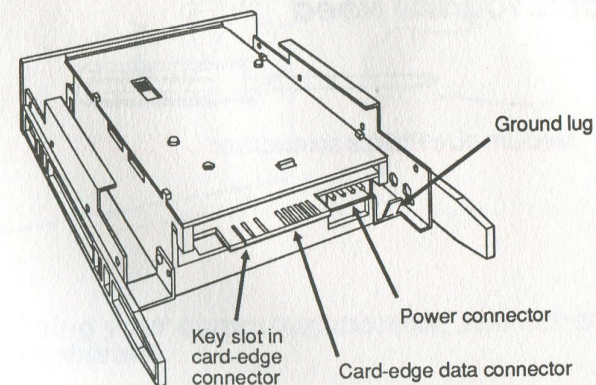
- Approved Tape list
- Buyer Registration card

Parts of the Tape Drive and Cable

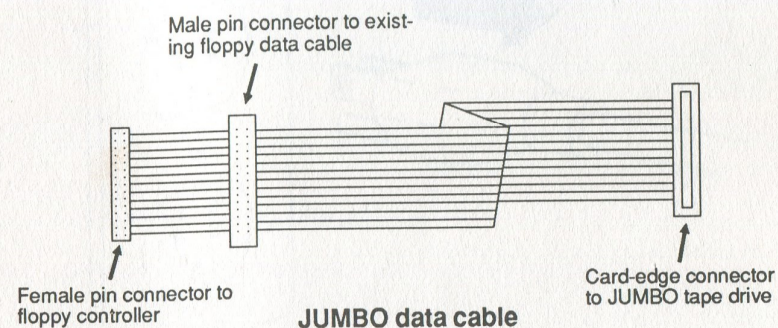
Parts of the Tape Drive and Cable



Front view of JUMBO tape drive



Rear view of JUMBO tape drive



JUMBO data cable

Installation

CAUTION: Carefully observe the procedure outlined in your computer's manual concerning power and electrical disconnection before installing the tape drive.

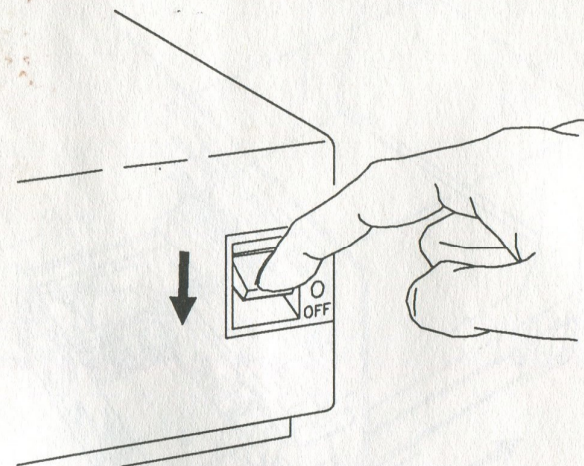
CAUTION: The discharge of static electricity can damage electronic circuitry. You can avoid static discharge by touching a grounded metal object such as your computer's case before and during installation of hardware inside your computer.

Tools You Will Need

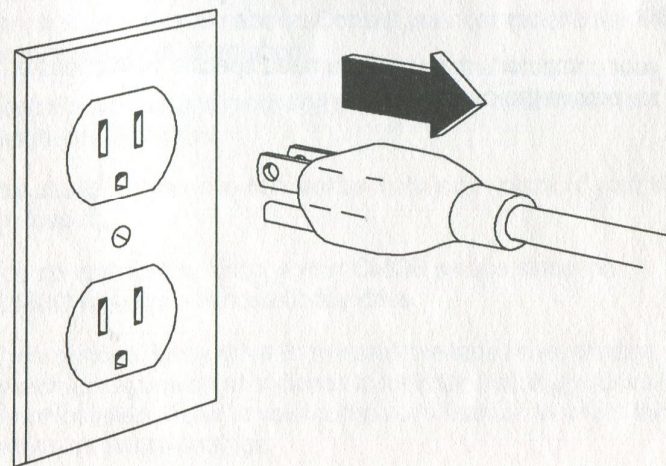


- Medium-size Phillips screwdriver

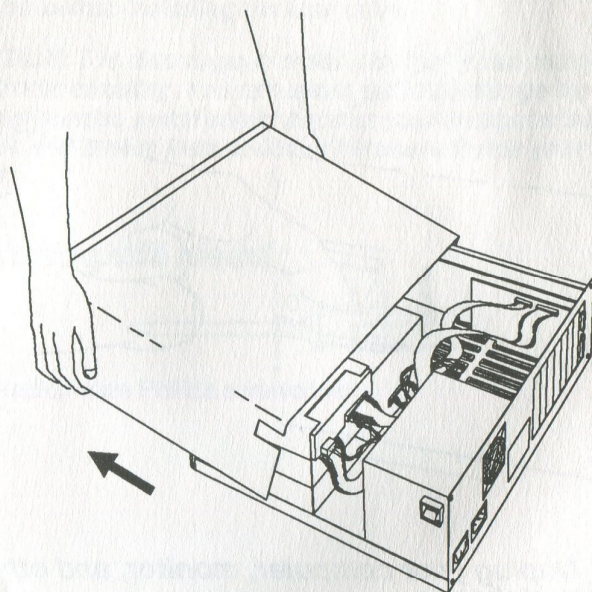
- 1** Turn off your computer, monitor, and other peripherals.



- 2** Unplug your computer, monitor, and other peripherals.



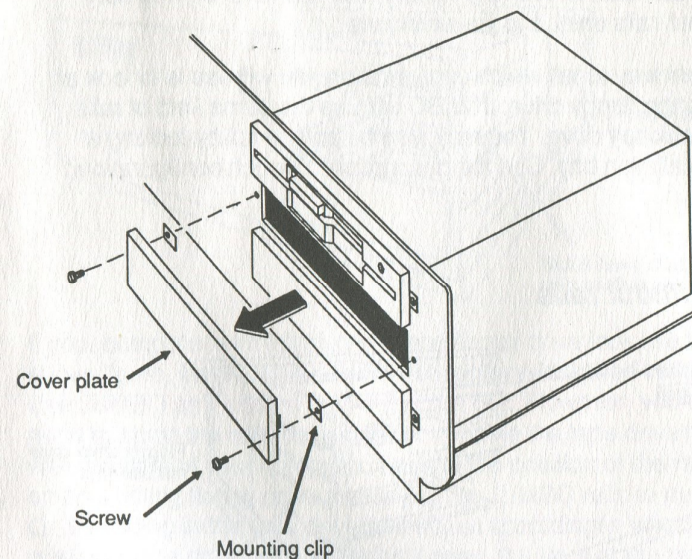
3 Remove the cover from your computer.



Notes:

See your computer's manual if you need specific instructions on how to remove the cover.

4 Remove screws, mounting clips, and cover plate from desired installation bay.



Notes:

Removal of your computer's installation bay cover plate may vary from the diagram above. Consult your computer's manual for more detailed information.

Keep the screws and mounting clips. You will need them to secure the tape drive.

The JUMBO tape drive can **not** be installed in place of your floppy drive A:.

You do **not** need to change your CMOS setups since the JUMBO tape drive is not a floppy drive.

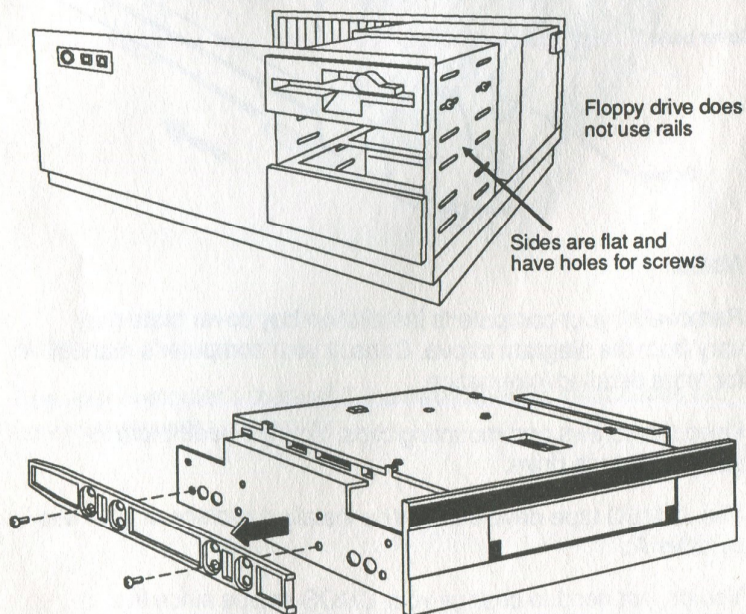
If you remove floppy drive B: to install the tape drive, change the system configuration or switches to indicate that floppy drive B: is **not** installed. Refer to your computer's manual for more information on switch settings.

5 Prepare the tape drive and mounting rails.

The JUMBO tape drive installs in one of three configurations:
1. Without rails, 2. With the factory-installed rails, 3. With non-standard rails unique to your computer.

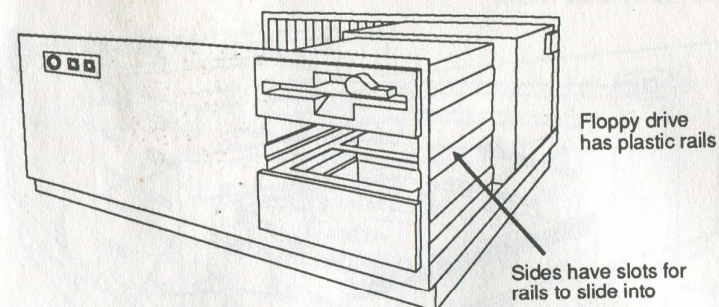
The best way to tell which configuration you will use is to look at an existing floppy drive: JUMBO will use the same kind of rails as your floppy drive. You may also be able to tell by looking at the installation bay. See the descriptions of each configuration below.

Without rails

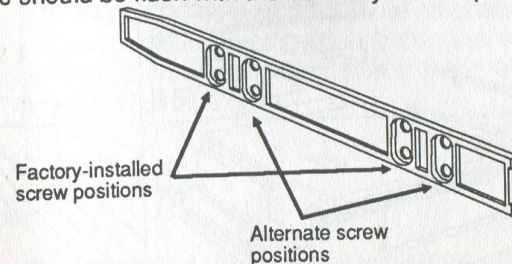


If your computer's installation bay and floppy drive look like the top figure, install JUMBO **without rails**. Remove the factory-installed plastic rails as shown in the bottom figure. Keep the screws for securing the tape drive later.

With the factory-installed rails



If your computer's installation bay and floppy drive look like the above figure, install JUMBO **with the factory-installed rails**. Use JUMBO as it comes right out of the box. However, you may need to move the rails back in order to make the tape drive flush with the front of your computer. Look at the position of the rails on an existing floppy drive and adjust the JUMBO rails to match. Or, try sliding in the tape drive and adjust accordingly; when you push the tape drive back as far as it goes, the front of the tape drive should be flush with the front of your computer.

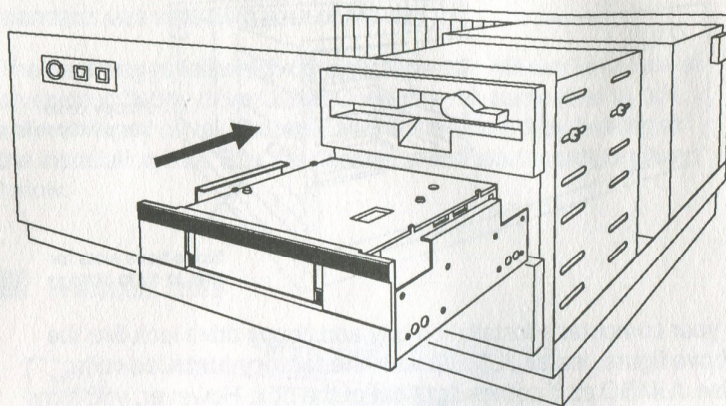


With non-standard rails

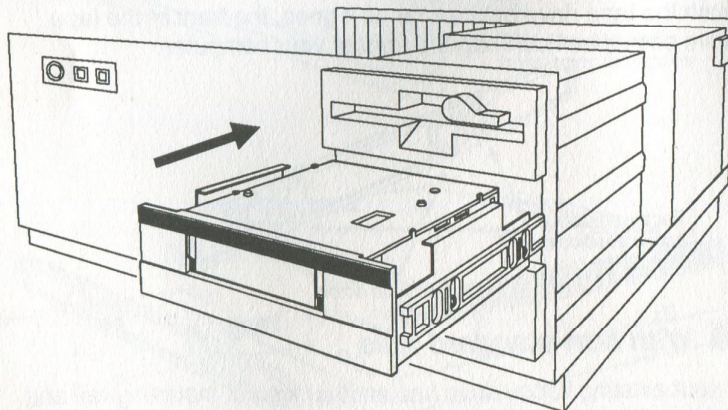
If your existing floppy drive has another kind of mounting rail and these rails did not come with your computer, you will need to purchase **non-standard rails** for your JUMBO tape drive. The *Compatibility and Accessory Guide* lists all of the available rail kits. Remove the factory-installed plastic mounting rails and install the rail kit as described in the rail kit manual now if you haven't already done so.

6 Slide tape drive into installation bay.

Without rails



With the factory-installed rails

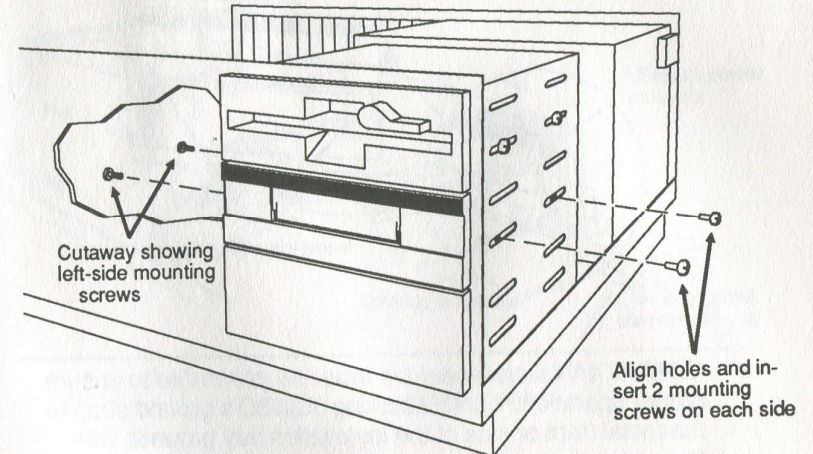


With non-standard rails

Slide tape drive into installation bay.

7 Secure and ground tape drive in bay.

Without rails



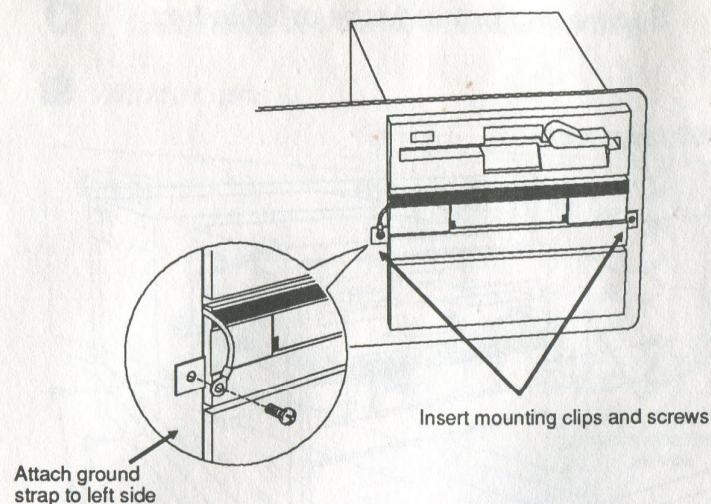
x IMPORTANT: The tape drive **must be grounded** to ensure proper operation. Tightly securing the steel mounting bracket of the tape drive to the metal side of the installation bay grounds your tape drive.

Notes:

Use the screws that you kept when you removed the factory-installed rails.

You do not need to use the JUMBO ground strap when you install JUMBO without rails as long as there is bare metal-to-bare metal contact.

■ With the factory-installed rails



x IMPORTANT: The tape drive **must be grounded** to ensure proper operation. Tightly securing JUMBO's ground strap to the metal front or side of the installation bay grounds your tape drive.

Notes:

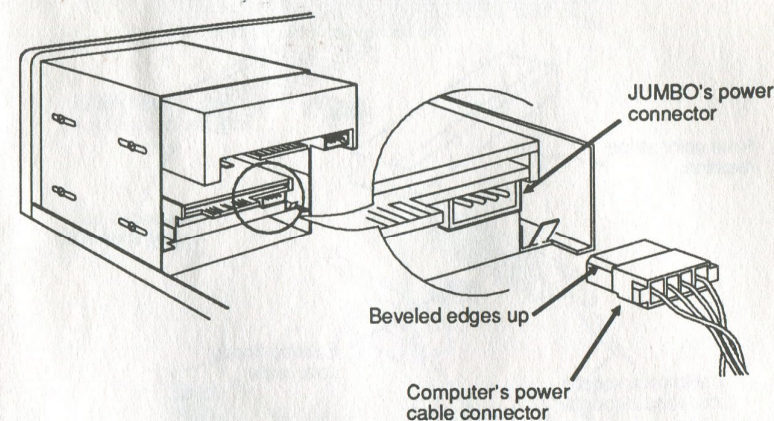
Use the screws and mounting clips that you saved when you removed the cover plate.

■ With non-standard rails

Secure the tape drive in the installation bay with screws. Your tape drive must be grounded by touching metal on the tape drive to metal on the computer case. This can be done by tightly securing the metal mounting brackets on the tape drive to the installation bay, by attaching the ground strap on the tape drive to the computer case, or by attaching one of the ground wires in your computer to the ground lug on the back of the tape drive. You only need to use one of these methods.

x IMPORTANT: The tape drive **must be grounded** to ensure proper operation.

8 Plug the computer's power cable into the back of the tape drive.



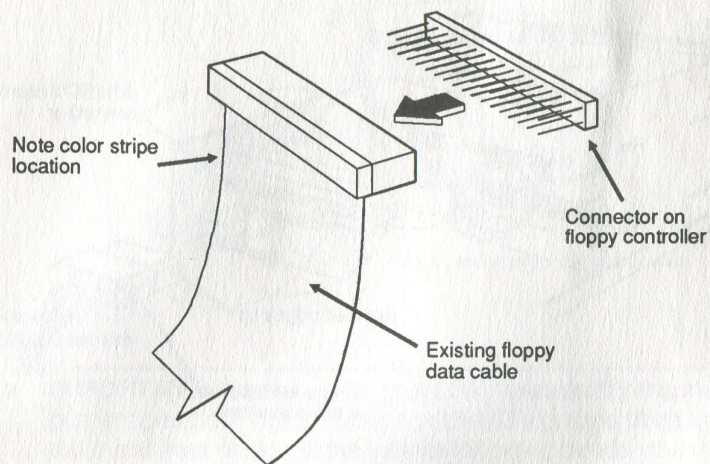
Notes:

Use any spare power cable in your computer. The power cables have four wires-1 red, 1 yellow and 2 black- coming out of the back of a white connector.

The power connector is keyed so that you can only plug it in one way. Press firmly until the connector snaps into place.

If your computer has no spare power cable or your cable is not long enough, you will need a CK-18 Y-power cable kit. See the *Compatibility and Accessory Guide* for details.

9 Unplug the floppy data cable from your floppy controller.

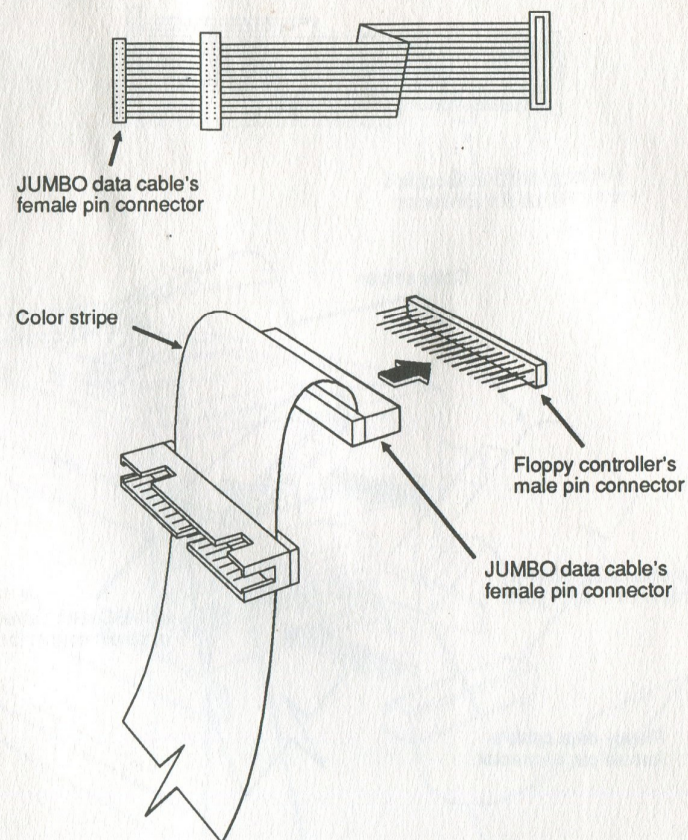


Notes:

Follow the flat ribbon cable from the back of one of your floppy drives to the controller board that is either in one of your expansion slots or on the motherboard. Before unplugging, make a note of the orientation of the color stripe on the cable. Unplug this cable from the controller board or motherboard.

You do **not** need to disconnect the data cable from the back of any of your floppy drives, only from the controller.

10 Connect the JUMBO data cable's female pin connector to the floppy controller.



Notes:

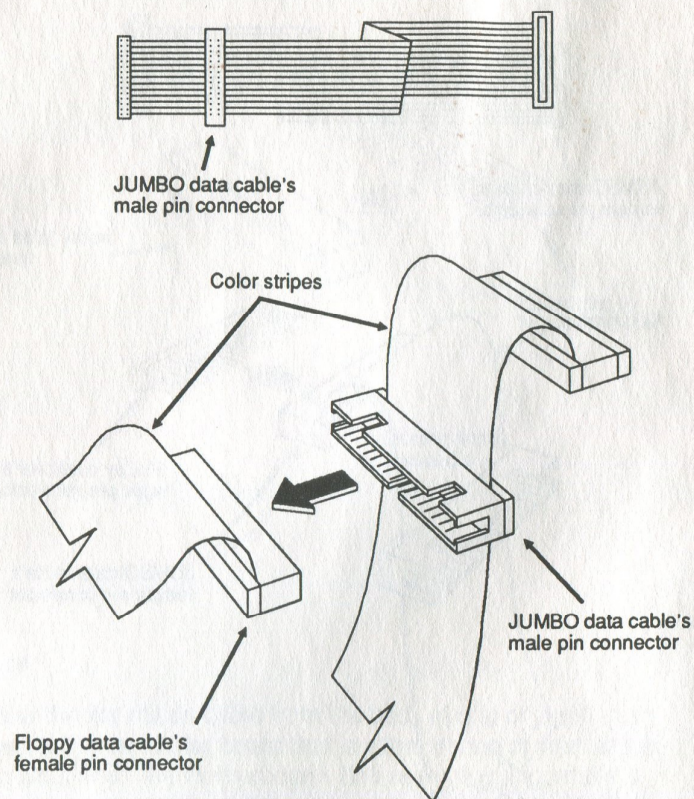
Orient the color stripe so that it is on the same side as it was on the original floppy cable.

Gently press the connectors together so as not to bend any of the metal pins.

Identify the JUMBO data cable's female pin connector by its two rows of holes.

11

Connect the JUMBO data cable's male pin connector to the floppy data cable.



Notes:

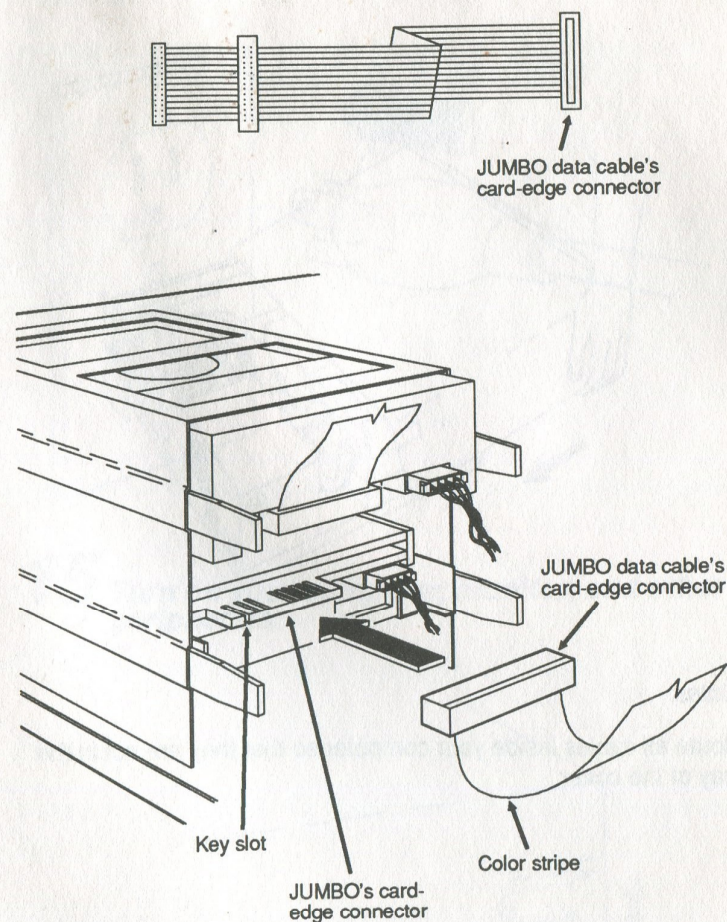
Match the color stripes on the cables.

Identify the male pin connector on the JUMBO data cable by its two rows of metal pins.

Identify the female pin connector on the floppy data cable by its two rows of holes.

12

Plug the JUMBO data cable's card-edge connector into the back of the tape drive.

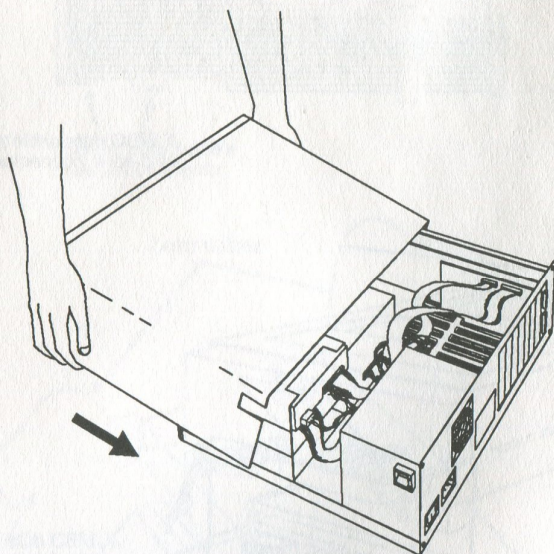


Notes:

You can identify the JUMBO data cable's card-edge connector by the long, narrow slot down the center of the connector.

The connector is keyed so that it can only plug in one way.

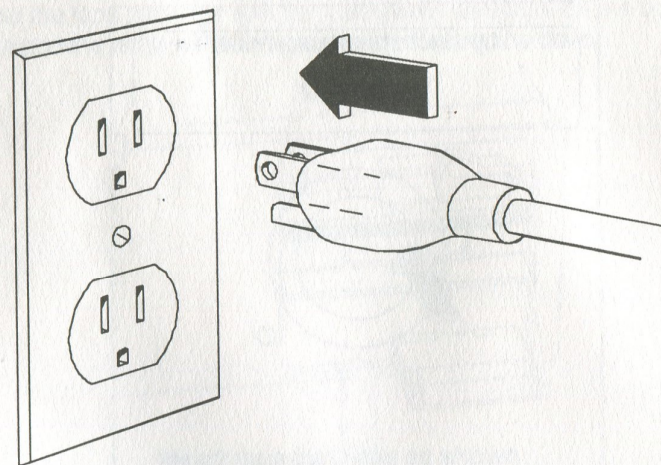
13 Put the cover back on your computer.



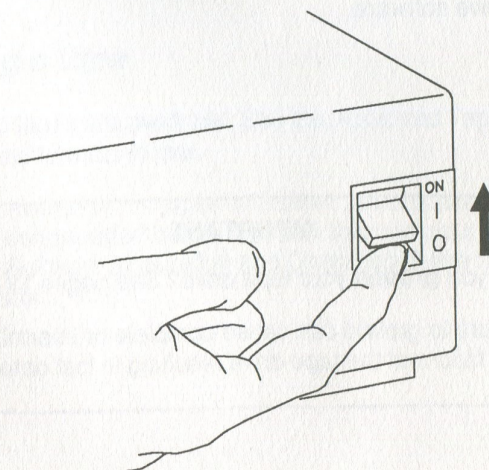
Notes:

Route all cables inside your computer so that they are not in the way of the cover.

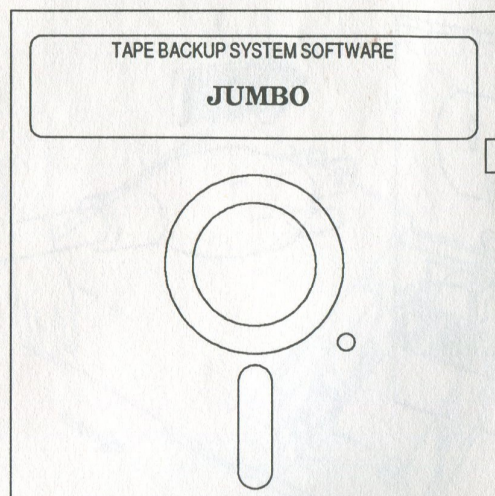
14 Plug in your computer, monitor, and other peripherals.



15 Turn on your computer, monitor, and other peripherals.



16 Install the tape drive software.



Notes:

Refer to your *Software Installation and Operation Guide* to install the tape drive software.

IMPORTANT

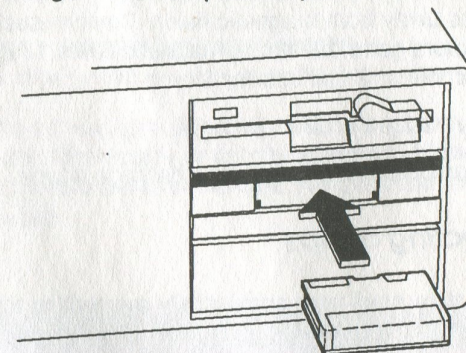
Did you **ground** your tape drive? See pages 13-14.

Failure to ground can cause complete or intermittent failure of the tape drive resulting in lost data.

Using Your JUMBO Tape Drive

Inserting a Tape

Hold the tape cartridge with the aluminum base-plate on the bottom and the edge with the exposed tape facing the drive.



Insert tape cartridge as shown

Push the cartridge into the drive until the tape is about three-quarters of the way into the drive. You will hear a click and feel it lock into place. Approximately 1/2" of the cartridge remains outside the drive. Remove the tape cartridge by pulling it out of the drive.

Formatting a Tape

Preformatted tapes are available. See the Approved Tape list for the brands and formats to use.

Tapes not preformatted or tapes with other formats than those in the list must be formatted before use with this backup system. Refer to the *Software Installation and Operation Guide* for formatting instructions.

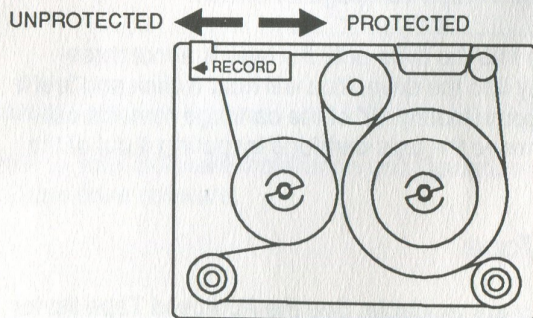
Tape Care

Observe the following tips to obtain maximum performance from your tapes throughout their life span.

- Handle the tape cartridge only. Touching the tape surface contaminates the recording media.
- Keep tapes away from magnetic fields. Devices such as electric motors generate strong magnetic fields. Magnetic fields scramble or erase information on the tape.
- Never leave a tape in direct sunlight.
- Extreme temperature changes can damage a tape.

Write-Protecting a Tape

You can protect yourself from accidentally overwriting tapes with important data by write-protecting the tape. Slide the record switch on the tape to the right to prevent writing on the tape.



Tape cartridge

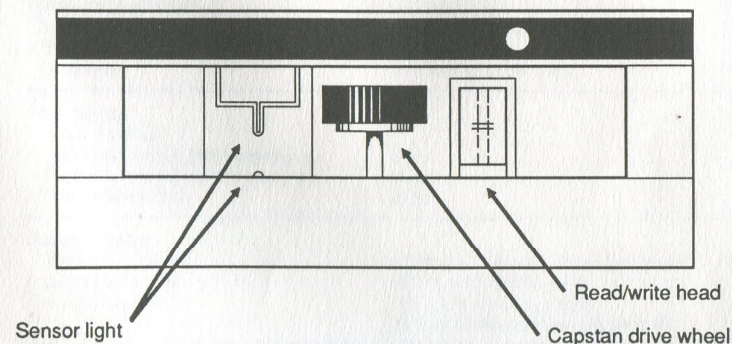
Cleaning Your Tape Drive

To maintain your backup system at its operating peak, clean the read/write head and sensor light after every 8 hours of tape operation, approximately 20 backups or restores. Residue build-up on the read/write head can cause the following message to be displayed after a tape operation is complete:

Caution - excessive read errors.

Clean read/write head - or - Replace tape cartridge

To clean the sensor light, use a can of compressed air purchased at an office supply or computer store to blow the dust away from the two areas of the light. Always clean the read/write head afterward.



Front view of tape drive

To clean the read/write head, use sponge-tipped swabs and 90% isopropyl alcohol. Do **not** use cotton swabs as they may leave behind fibers that can damage the head. Follow the steps listed below:

1. Turn off the computer.
2. Note the location of the read/write head. It is approximately two inches back from the front faceplate.
3. Dip a sponge-tipped swab in the alcohol and squeeze off the excess. No alcohol should drip into the tape drive. Rub the

tip of the swab back and forth several times over the read/write head until it is shiny. Use a clean, dry swab to dry the read/write head and remove any residue.

4. You can then re-apply power and use the tape drive.
5. If cleaning the head does not solve the problem, the tape may be wearing out. Replace worn tapes **before** you lose valuable data. Call Customer Support if you need additional information.

An alternative method of head cleaning is to use an approved cleaning cartridge to clean the read/write head. Follow the instructions included with the cleaning cartridge for proper operation.

Specifications

CAPACITY (After ECC) 205 ft DC2000 cartridge 307 ft DC2120 cartridge	40.4 MB; ~80 MB w/compression 60.6 MB; ~120 MB w/compression
TAPE FORMAT	QIC-40 (20 tracks, 10,000 FRPI)
RELIABILITY Hard Error Rate MTBF	<1 in 10 ¹⁵ bits read with ECC 40,000 hours (6% tape motion)
PERFORMANCE 10MB file-by-file backup at 500 kb/s transfer rate at 250 kb/s transfer rate End-to-end seek time Format time at 500 kb/s transfer rate at 250 kb/s transfer rate	<6 minutes typical <10 minutes typical 28 seconds 36 minutes 72 minutes
POWER REQUIREMENTS 12VDC(±5%) 5VDC(±5%) Total power	0.8A avg. 2.75A peak <150ms duration 0.3A 1.5W standby, 11.5W typical
TAPE MOTION Speeds and times Read/Write/Format @ 250 kb/s transfer rate Read/Write/Format @ 500 kb/s transfer rate Forward/Reverse/Seek	25 ips 50 ips 90 ips
ENVIRONMENTAL Temperature-Operating Shipping and storage Humidity-Operating	+41° to +113° F(cartridge limited) (+5° to +45° C) -40° to +148° F (-40° to +65° C) 20% to 80% RH non-condensing 80° F (27° C) Maximum dew point (wet bulb)
PHYSICAL Overall size (Internal drive) Weight (Internal Drive)	4.0" wide, 1.625" high, 5.32" deep (101.6x41.2x135mm) 1.25 lb (0.56kg) (w/brackets, faceplate and rails)
TAPE (FLOPPY) CONTROLLER Type Encoding method Data transfer rates Transfer rate selection	IBM® PC/XT/AT, PS/2® and compatible MFM 250kb/s and 500kb/s Automatically switches to fastest allowable rate (software controlled).
COMMUNICATIONS	QIC-117 Common Command Set
RAM REQUIRED	512 KB

**COLORADO MEMORY SYSTEMS™, INC.
ONE YEAR
LIMITED HARDWARE WARRANTY**

What Does This Warranty Cover?

Colorado Memory Systems, Inc. (the "Company") warrants to the Purchaser that the Company's hardware is free from defects in workmanship or material under normal use and service. This warranty commences on the date of delivery of the hardware to the Purchaser.

What are the Company's Obligations Under This Warranty?

During the warranty period, the Company agrees to repair or replace, at its sole option, without charge to Purchaser, any defective component part of the hardware. To obtain service, Purchaser must return the hardware to the Company or an authorized Company distributor in an adequate container for shipping. To obtain assistance on where to deliver the hardware, call 1-800-346-9881. The shipping and insurance charges incurred in shipping to the Company will be paid by Purchaser. Upon receipt, the company will promptly repair or replace the defective unit, and then return said unit to Purchaser, postage and insurance prepaid. The Company may use reconditioned or like new parts or units, at its sole option, when repairing any hardware. Any claim under the warranty must include a dated proof of purchase or invoice. In any event, the Company's liability for defective hardware is limited to repairing or replacing the hardware.

What Does This Warranty Not Cover?

This warranty is contingent upon proper use of the hardware by Purchaser and does not cover: expendable component parts such as tapes and the like; or if damage is due to accident, unusual physical, electrical or electromechanical stress, neglect, misuse, failure of electric power, air conditioning, humidity control, transportation, operation with media not approved by the Company, or tampering with or altering of the hardware.

What is the Length of the Warranty?

ANY IMPLIED WARRANTIES COVERING THE HARDWARE, INCLUDING ANY WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO ONE YEAR FROM THE DATE OF DELIVERY TO PURCHASER. Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you.

What are the Limits on the Company's Liability?

IN ANY CASE, THE COMPANY SHALL NOT BE LIABLE TO YOU FOR LOSS OF DATA, LOSS OF PROFITS, LOST SAVINGS, SPECIAL, INCIDENTAL, CONSEQUENTIAL, INDIRECT OR OTHER SIMILAR DAMAGES ARISING FROM BREACH OF WARRANTY, BREACH OF CONTRACT, NEGLIGENCE, OR OTHER LEGAL THEORY EVEN IF THE COMPANY OR ITS AGENT HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, OR FOR ANY CLAIM BY AN OTHER PARTY. Some states do not allow the exclusion or limitation of incidental consequential damages, so the above limitation or exclusion may not apply to you.

This warranty allocates risks of product failure between Purchaser and the Company. The Company's hardware pricing reflects this allocation of risk and the limitations of liability contained in this warranty. The warranty set forth above is in lieu of all other express warranties, whether oral or written. The agents, employees, distributors, and dealers of the Company are not authorized to make modifications to this warranty, or additional warranties binding on the Company. Accordingly, additional statements such as dealer advertising or presentations, whether oral or written, do not constitute warranties by the Company and should not be relied upon.

This warranty gives you specific legal rights. You may also have other rights which vary from state to state.

**Colorado Memory Systems, Inc.
800 South Taft Avenue
Loveland, Colorado 80537 U.S.A.**

Notes

Notes

IMPORTANT

Did you **ground** your tape drive? See pages 13-14.

Installation Problems?

If this guide does not answer all your installation questions, technical assistance is available from Colorado Memory SystemsTM, Inc. Customer Support.

In the U.S., Canada and Mexico select a number from the chart below:

Purpose of Call:	Dial This Number:
Product Information/Purchases	(800) 845-7905
DOS Computers: Hardware and Software questions	(800) 845-7906
Unix [®] /Xenix [®] Computers: Hardware and Software questions	(800) 845-7908
Novell [®] NetWare [®] questions	(800) 845-7910
Bulletin Board Services	(303) 635-6650

**All other outside U.S. (303) 669-6500
FAX (303) 667-0997**

**7 A.M. - 6 P.M. MONDAY - FRIDAY
Mountain Time**